

CLAIMS

1. A radio communications device comprising three or more diverse antennas and either a plurality of transmit chains or a plurality of receive chains, and wherein there are fewer transmit or receive chains than antennas.
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2. A radio communications device as claimed in claim 1 which is arranged to provide multiple-input multiple-output communications.
3. A radio communications device as claimed in claim 1 wherein said antennas each have directionality.
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4. A radio communications device as claimed in claim 1 wherein the diversity of the antennas is achieved via any of spatial diversity and polarisation diversity.
5. A radio communications device as claimed in claim 1 which is selected from a basestation and a user terminal.
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6. A radio communications device as claimed in claim 1 which further comprises a selector arranged to select for each receive chain or for each transmit chain, any one of the antennas for use in conjunction with that receive or transmit chain.
- 20 7. A radio communications device as claimed in claim 6 wherein said selector comprises a switching mechanism arranged to switch the antennas between the transmit chains or between the receive chains.
8. A radio communications device as claimed in claim 6 wherein said selector is arranged to select on the basis of a parameter related to a cyclic redundancy check process.
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9. A radio communications device as claimed in claim 8 wherein said selector is further arranged to select for each receive chain

any one of the antennas not currently selected for use in conjunction with any of the receive chains.

10. A radio communications device as claimed in claim 8 wherein said selector is further arranged to select for each transmit chain any one of the antennas not currently selected for use in conjunction with any of the transmit chains.

11. A radio communications device as claimed in claim 6 wherein said selector is arranged to select on the basis of a signal strength indicator.

12. A radio communications device as claimed in claim 6 which is arranged to provide multiple-input multiple-output communications and where said selector is arranged to select on the basis of parameters related to any of, a frame error rate, link capacity and eigenvalues.

13. A radio communications device as claimed in claim 1 wherein each of said antennas is arranged to provide a directional antenna beam and wherein at least some of those antenna beams are of substantially different pointing directions than the other antenna beams.

14. A radio communications device as claimed in claim 1 comprising four pairs of antennas each pair of antennas being supported from a body which is sized and shaped such that it is portable and suitable to be supported on a substantially flat surface.

15. A radio communications device as claimed in claim 14 wherein said body is a parallelepiped and each pair of antennas is supported from a different face of said parallelepiped.

16. A radio communications device as claimed in claim 14 wherein said antennas are dipoles.

17. A radio communications device as claimed in claim 16 wherein one of each pair of dipoles is arranged such that its ends are directed towards the body.
18. A radio communications device as claimed in claim 14 which further comprises a selector arranged to select a first subset of the antennas for transmission and a second subset of the antennas for reception.
19. A radio communications device as claimed in claim 18 which is suitable for use in a multiple-input multiple-output communications system and where the first subset is two of the antennas and the second subset is four of the antennas.
20. A radio communications network comprising a radio communications device as claimed in claim 1.
21. A radio communications network as claimed in claim 23 comprising a plurality of user terminals each being a radio communications device as claimed in claim 1 and wherein each of said antennas at those user terminals is arranged to provide a directional antenna beam and wherein at least some of those antenna beams are of substantially different pointing directions than the other antenna beams.
22. A method of operating a radio communications device which comprises three or more diverse antennas and either a plurality of transmit chains or a plurality of receive chains, and wherein there are fewer transmit or receive chains than antennas, said method comprising the steps of:
- (i) selecting, for each receive chain or for each transmit chain, any one of the antennas for use in conjunction with that receive or transmit chain.
23. A method as claimed in claim 25 wherein said step of selecting comprises selecting on the basis of a signal strength indicator.

24. A method as claimed in claim 26 wherein said antenna arrangement is arranged to provide multiple-input multiple-output communications and wherein said selector is arranged to select on the basis of parameters related to any of, a frame error rate, link capacity, cyclic redundancy check information and eigenvalues.
25. A computer program stored on a computer readable medium and arranged to carry out the method of claim 22.